

WHAT IS CLAIMED IS

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1. A branch prediction method comprising the steps of:
- 10 a) determining branch prediction data indicating a state of branch prediction according to whether a branch is actually made or not;
- b) performing a branch prediction according to the branch prediction data; and
- 15 c) correcting the branch prediction data according to whether a branch is actually made or not.
- 20 2. The method as claimed in claim 1, wherein the step c) selects a predetermined branch prediction changing table from a plurality of branch prediction changing tables previously weighted according to a history of whether or not branches
- 25 are actually made, reads therefrom branch prediction updating data corresponding to the branch prediction data, and determines the read branch prediction updating data as a new branch prediction data.
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3. The method as claimed in claim 1, wherein: the step c) comprises the steps of:
- 35 c-1) obtaining branch prediction data corresponding to a branch instruction from a branch prediction table;

c-3) selecting a branch prediction  
5 updating table corresponding to the branch  
prediction supplementary data from a plurality of  
branch prediction updating tables storing branch  
prediction data having different weights in  
transition directions of the branch prediction data,  
10 and outputting branch prediction updating data  
corresponding to the branch prediction data; and  
c-4) updating the branch prediction table  
according to the branch prediction updating data of  
the branch prediction/updating table.

4. The method as claimed in claim 1,  
20 wherein the step c) sets weightings in transition  
directions of the branch prediction data according  
to preset profile information.

5. An arithmetic and logic unit comprising:

- a first part determining branch prediction data indicating a state of branch prediction according to whether a branch is actually made or not;
- a second part performing a branch prediction according to the branch prediction data;
- a third part correcting the branch prediction data according to whether a branch is actually made or not.

6. The unit as claimed in claim 5 wherein  
said third part selects a predetermined branch  
prediction changing table from a plurality of branch  
prediction changing tables previously weighted  
5 according to a history of whether or not branches  
are actually made, reads therefrom branch prediction  
updating data corresponding to the branch prediction  
data, and determines the read branch prediction  
updating data as a new branch prediction data.

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7. The unit as claimed in claim 5,  
15 wherein said third part comprises:  
a part obtaining branch prediction data  
corresponding to a branch instruction from a branch  
prediction table;  
a part obtaining branch prediction  
20 supplementary data according to a history of whether  
or not branches are actually made;  
a part selecting a branch prediction  
updating table corresponding to the branch  
prediction supplementary data from a plurality of  
25 branch prediction updating tables storing branch  
prediction data having different weights in  
transition directions of the branch prediction data,  
and outputting branch prediction updating data  
corresponding to the branch prediction data; and  
30 a part updating the branch prediction  
table according to the branch prediction updating  
data from the branch prediction updating table.

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8. The unit as claimed in claim 5,

wherein said third part sets weightings in transition directions of the branch prediction data according to preset profile information.

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10            9. An information processing apparatus comprises the arithmetic and logic unit claimed in claim 5.

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10. An arithmetic and logic unit comprising:  
a first part performing a branch prediction in response to a branch instruction;  
a second part updating a transition probability of branch prediction according to whether a branch is actually made or not;  
a third part detecting that a process is  
25 switched; and  
a fourth part initializing the branch prediction information when said third part detects that the process is switched.

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11. The unit as claimed in claim 10, wherein said fourth part performs initialization based on prediction information given to the branch instruction.

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12. The unit as claimed in claim 10,  
wherein said fourth part performs initialization  
according to a branch destination of the branch  
instruction.

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13. A branch prediction method comprising  
10 the steps of:

a) performing a branch prediction in  
response to a branch instruction;

b) updating a transition probability of  
branch prediction according to whether a branch is  
15 actually made or not;

c) detecting that a process is switched;  
and

e) initializing the branch prediction  
information when the step c) detects that the  
20 process is switched.

14. The method as claimed in claim 13,  
25 wherein the step e) performs initialization based on  
prediction information given to the branch  
instruction.

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15. The method as claimed in claim 13,  
wherein the step e) performs initialization  
35 according to a branch destination of the branch  
instruction.

16. An information processing apparatus comprising:

a first part performing a branch prediction in response to a branch instruction;

5 a second part updating a transition probability of branch prediction according to whether a branch is actually made or not;

a third part detecting that a process is switched; and

10 a fourth part initializing the branch prediction information when said third part detects that the process is switched.

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A8 17. The apparatus as claimed in claim 16, wherein said fourth part performs initialization based on prediction information given to the branch instruction.

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25 18. The apparatus as claimed in claim 16, wherein said fourth part performs initialization according to a branch destination of the branch instruction.

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